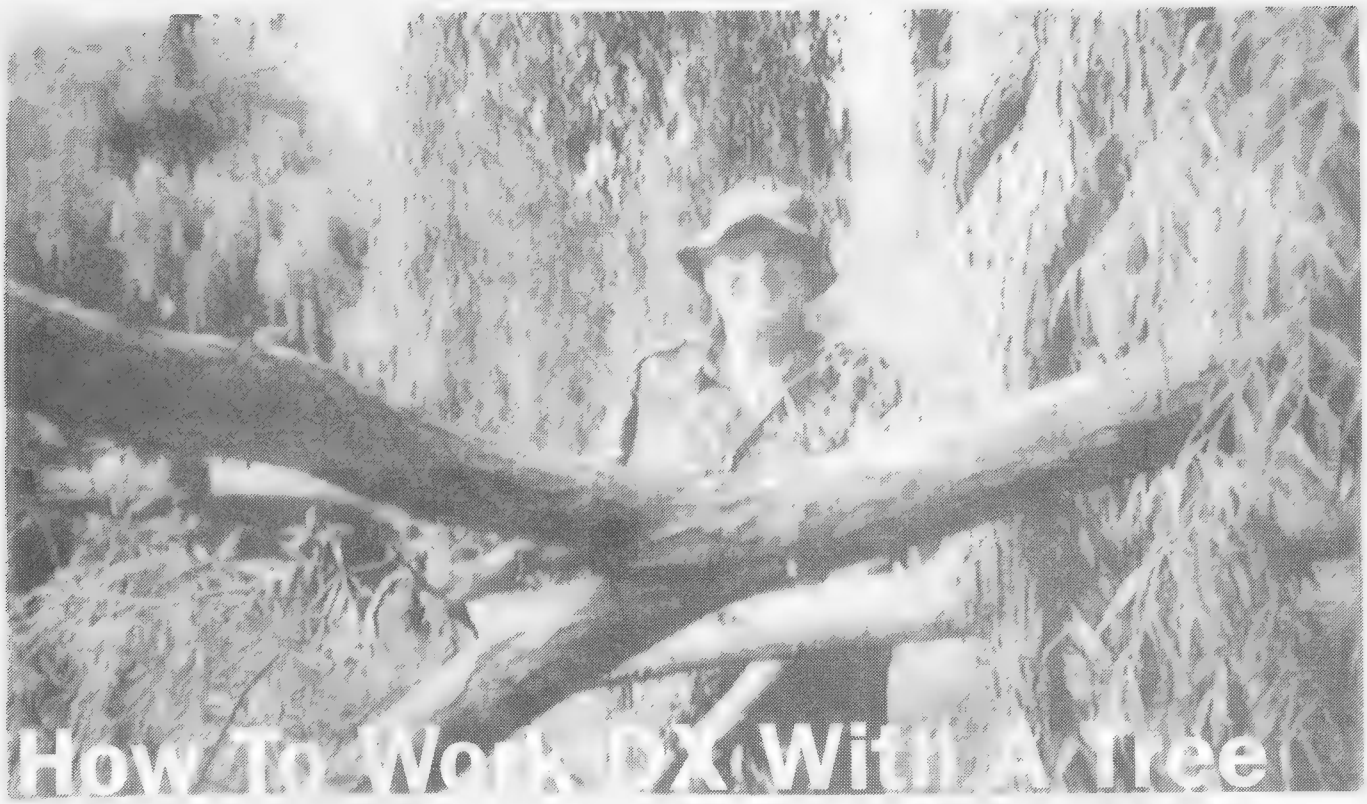

How To Work DX With A Tree

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I am working DX on a gum tree. Arthur Andrews VK2AAE aroused my interest with his article in September 1998 Radio and Communications on Arboreal Antennas. There are a lot of interesting facts in his two page article. The most informative being the sketch of the cross section of a tree trunk showing the various areas through to the heart of it, at the centre.

After reading his article several times I started thinking. I've got to find a tree that resonates to the twenty metre band. Twenty metres is a well used band and at about 1700 local time on 14.017 MHz F8AH is calling CQ LP on CW almost daily at RST 599.

It turned out to be a very good choice. At the west end of my shack grows a mature Cootamundra Wattle. Its trunk is almost 10 metres long well over the roof of my shack. I inserted a long thick self tapper into the trunk at 2 metres above ground. I connected the inner of a 50 Ohm coax to the self tapper with the outer connected by a length of braid connected to a metal spike driven into the ground at the base of the tree. A check with a DX200 communications receiver found maximum noise and signals in the 20 metre band. I then connected the coax to the input of an FC700 ATU which was connected to the input of the FC757 automatic ATU feeding my FT757GX.

The FC700 was used as an antenna tuning unit feeding the automatic FC757 tuner which was used to make sure the SWR was within the safe operating range of the FT757GX. Later I was able to use only the FC700 direct to the FT757 to achieve a suitable match.

The FC700 was adjusted to give maximum received noise at 14.017 MHz and the transceiver was tuned to a signal close to the frequency. Adjustment was then made for best received signal with the FC700 but with the auto tuner switched out of circuit. The tree antenna is now resonated to 14 MHz. The FC757 auto tuner is then brought into circuit in series with the FC700. With about 10 watts drive the auto tuner is used to achieve a match indicated by the two green lights. Now the full 100 watts can be run. With all units indicating 100 watts the SWR was 1.4:1 which was much better than I expected. I tuned to 14.017 ready for the French station to make his almost daily call call on long path in the late afternoon.

On 5th October 1998 at approx 0700 UCT F8AH calling CQ LP answered my first tree call. Signals were RST 539 QSB 339 and we made a complete QSO and exchanged QSL cards direct. Conditions on 14 MHz were fairly good and the band just opened up.

Having proved that a tree can work DX under fair conditions especially when the tree is an acacia type with a trunk that curves over the top of my shack that has a corrugated metal roof, not really ideal conditions, I think John Williams would like it, I decided to find a better situation. I have 4 gum trees in my garden all of them on the remote side of the shack. The nearest one is a Wallangarra white gum, a monster with a huge trunk and lots of foliage. So I put a piece of wood into a large wheelbarrow, put my standby FT101E onto the wood and took my FC700 ATU and the longest screw in probe I could find.This was a large ceiling hook. For power I used an extension lead from the shack.

The tree trunk was enormous so I got a step ladder and managed to get the probe screwed into the lowest bough about 4 metres up. I connected the coax braid to the metal wheelbarrow. I set up the FT101E and the FC700 and found the system resonated

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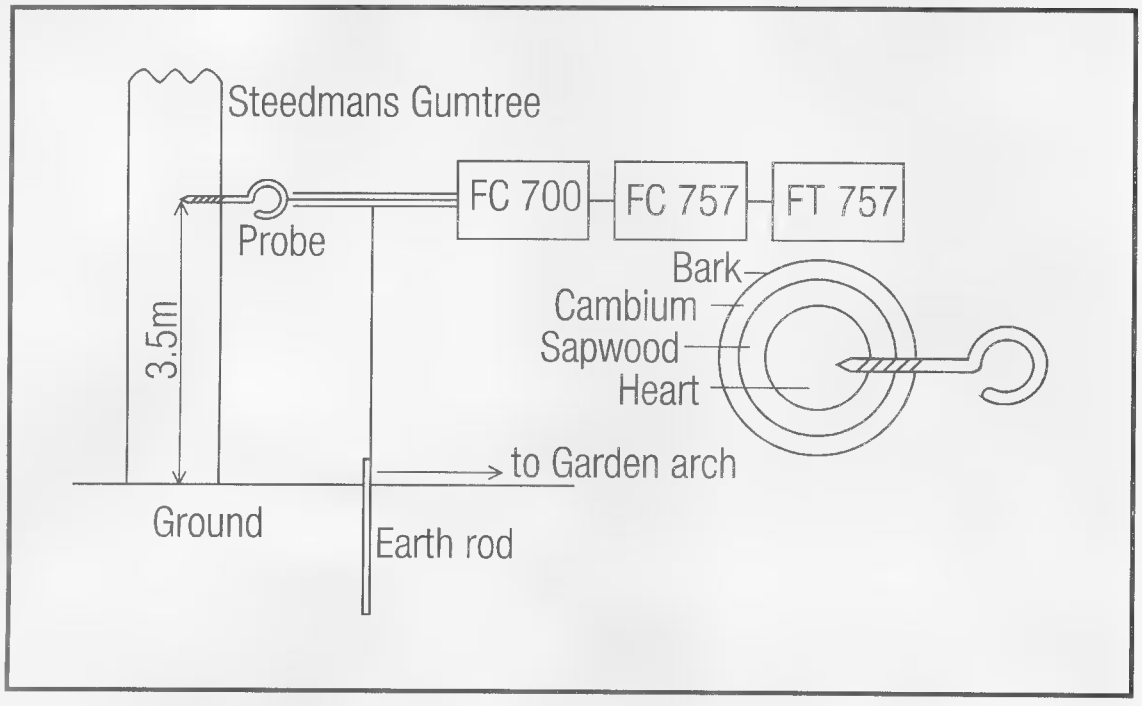

to 80 metres. I then QRV'd for a while with quite a good SWR and VK2MAI in Wauchope heard my signal on 3.528 MHz. Now the point is I want to find a tree that resonates to 14 MHz. Well I struck lucky. About 4 metres from my front verandah a Steedmans gum tree grows which my XYL planted about 40 years ago. It has a long trunk with a kind of delta formation of branches at the top. Now according to VK2AAE's diagram of the cross section of a tree bole it is obvious that that a probe has to go right through the sap into the heart of the bole.

I went to the hardware store and found exactly what I wanted - a probe with a screw section that would suit my purpose. The length of the screw section equals the radius of the tree trunk. The round flange ensures the probe is into the tree heart when fully screwed in. It is stainless steel and a really solid job. It is no good putting the probe into the base of the tree. I screwed it in 3.5 metres above the ground.

The next problem was to connect the FT757 rig to the probe via a long length of 50 Ohm coax right across the roof of the house and connect to the probe with a very strong clamp. The earth lead was 3.5 metres long connected to a metal spike at the base of the tree. I loaded up the FT757 and the FC700 and to my delight the tree was OK for 20 metres. I made a CQ DX call and back came HB9KAR giving me RST 539. Then DL5FCZ gave RST 549. I then decided to set up the FT757 rig and the FC700 on the front verandah which must be in a better situation reducing the coax feeder to about 4 metres. Using the new set up I got RST 559 from RW3XW, F6CEL, and F0GPT. I was still dissatisfied.

I mounted a 2 way coax switch and erected a three quarter wavelength sloper so that I could switch from the wire antenna to the tree antenna. I reckoned that my ultimate success depended on a really good earthing system. I connected braid in parallel with the earthing spike to a large stainless steel garden arch adjacent to the tree. This required a hole to be drilled in one leg of the arch for an attachment screw. The four legs of the arch were strapped together. To my delight the signals went up a couple of strengths. I carefully set up the 757 and FC700 for minimum SWR of 1.3:1. I called CQ and ZL1AW gave me RST579. Then VK7CW gave me RST 599. During the QSO with one of these stations I reduced my output to 10 Watts and still got 559. 20 metres was not yet open for DX . Later in the afternoon I went for DX contacts and the results were pretty good. JA7XGI/P RST 559, T32VU RST559, TI2OY RST 559, IK5ALZ RST 559, and F8AH RST 579. I compared the tree with the three quarter wave sloper and found that the strength only improved S1. That's good enough because the tree acts as a vertical antenna. I checked the radiation pattern with a field strength meter and got a circular pattern pretty average except to the east . There is my corrugated iron roof west of the tree so I took no notice of that.

On 4th February 1999 I QSO'd with DJ7AA who gave me RST 559 whereas I gave him RST 569. I have decided to use the tree as a permanent facility. The sloper remains as a useful addition and can be used on other bands.

Important details about the probe. First of all determine its exact length as follows. Measure the circumference of the tree trunk exactly where the probe is to be screwed in . Then work out the radius . This will give you the length of the probe. Screw the probe in at 3.5 metres height but not fully. This is very important.

The probe must not go through the exact centre of the trunk but remain a small distance back. The probe is not right through the centre. I use a large stainless steel alligator clamp to connect to the probe which is 8 mm in diameter. Any hardware store stocks these probes and it is the screw in part which must equal the trunk radius. I removed the auto ATU from circuit feeding the tree using only the FC700 ATU and the FT757GX and it works perfectly. My log reads 2 pages of DX QSO's. Also during my experiments I asked VK4RAN to listen for me on 7.022 MHz and he could not hear my signals yet he could hear me on the helical I have connected to the FT101E sitting next to the FT757GX and I reckon there was proof enough there that a tree has a resonant frequency. The only other consideration is that a tree is a calm weather antenna so don't expect it to perform efficiently in the pouring rain or when a strong wind is blowing.

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